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GUY P. JONES
Editor

POISON GASES IN WARFARE

The people of California are somewhat disturbed over the possibility that poisonous gases may be used by the Japanese in an invasion of California. It has been pointed out that chemicals have not been used to any great extent in World War II for the reason that the military objectives are machines rather than men, that efforts are concentrated in the destruction of tanks, guns, airplanes and all weapons and vehicles of every type and description. Nevertheless, there is every reason to believe that poisonous gases might be used in an invasion of California for the purpose of weakening or destroying public morale.

Professor Joel Hildebrandt of the University of California is reported to have said in a recent address before the Commonwealth Club, San Francisco, that gas masks should not be demanded by the civilian population, that they may not actually be needed by civilians, but they are indicated in the protective armament of the Army. He said that in a poisonous gas attack, civilians should seek upper floors of buildings and if attacked by a gas such as mustard gas or Lewisite, they should remove all of their clothes, throw them out of the window and bathe with the use of unlimited quantities of soap. If lung irritants such as chlorine gas or phosgene are encountered, a wet towel should be thrown over the head or the individual should breathe through a wet cloth placed over the nose and mouth. Aside from some of these simple measures that may be taken, there is little left for the individual to do but place his head under his pillow and pray. Nevertheless, it is important that all individuals should have reliable information relative to the chemical warfare agents that are in common use

and the methods that should be employed in rendering first aid for the relief of individuals who may be attacked.

The Office of Civilian Defense has prepared a reference and training chart upon the subject that provides information in chart form. Gases used in warfare are classified as follows:

1. Vesicants, or blister gases, such as mustard gas and Lewisite. Mustard gas is in the form of liquid and vapor. It may have the *odor of garlic, horseradish or mustard*. Its effect is delayed. It burns the skin or membrane, may cause inflammation of the respiratory tract leading to pneumonia. It causes eye irritations. The gas may persist from one day to one week or longer if the weather is dry or cold. The victim should undress, remove liquid mustard with protective ointment, bleach paste or kerosene and should bathe using large quantities of soap and washing the eyes and nose with soda solution. In field neutralization, liquid gas should be covered with unslaked lime and earth or a 3 per cent solution of sodium sulfite.

Lewisite is a liquid and vapor which *smells like geraniums*. It may cause burning or irritation of the eyes, nasal passages, respiratory tract and skin. It is an arsenical poison. It is as persistent as mustard gas and may endure for one day to one week or longer if the weather is dry or cold. The victim should undress, remove the liquid Lewisite with peroxide of hydrogen, lye in glycerine, or kerosene, should bathe using plenty of soap and should wash the eyes and nose with soda. Complete rest is indicated and a physician should be called immediately. In field

neutralization Lewisite should be washed down with water and covered with earth.

A gas commonly used which is also a vesicant is ethyldichlorarsine, which produces a *stinging sensation like pepper in the nose*. It too is a liquid and vapor gas causing blisters, sores, paralysis of the hands and vomiting. Long exposures are severe. The gas persists for only one hour. The procedures for victims of this gas are the same as those for Lewisite.

2. Lung Irritants

Lung irritants that have been used in warfare are chlorine, chlorpicrin, diphosgene and phosgene. Chlorine gas is a lung irritant that is highly pungent. It persists for only about 10 minutes. Victims should be removed from the gassed area, kept quiet and warm and coffee applied as a stimulant. An alkaline solution is used in field neutralization.

Chlorpicrin *smells like flypaper or anise*. It causes severe coughing and vomiting. In the open it may persist for six hours and in the woods and forest for as long as 12 hours. The victim should wash his eyes, keep quiet and warm and should not use bandages.

Diphosgene causes coughing, painful breathing and the eyes water. The gas *has an acrid odor like decayed vegetable matter*. It persists for 30 minutes. The victim should be kept quiet and warm; coffee should be given as a stimulant. Alkali is used in field neutralization.

Phosgene *smells like musty hay or green corn*. It causes irritation of the lungs, vomiting, tears in the eyes and a doped feeling. Occasionally the symptoms are delayed. Later there may be collapse and heart failure. The gas persists for 10 to 30 minutes. The victim should be kept quiet and warm with rest in bed. Coffee is used as a stimulant. The clothing should be loosened and no alcohol or cigarettes should be given. Alkali is commonly used in field neutralization.

3. Lacrimators

The common lacrimator gases are chloracetophenone, which *smells like apple blossoms* and brombenzylcyanide which *smells like sour fruit*. Both of these gases cause the eyes to smart and tears to flow. The first named gas persists for about 10 minutes while the brombenzylcyanide may last for several days or for several weeks in winter. Victims should wash the eyes with cold water or boric acid solution. No bandages should be used.

4. Sternutators

Gases that cause sneezing are adamsite which *smells like coal smoke* and diphenylchlorarsine which *smells*

like shoe polish and which is a smoke. Both of these gases persist for about 10 minutes. The adamsite victim should be kept warm and quiet, clothing should be loosened and the victim should sniff bleaching powder and take aspirin for the severe headache which accompanies the sneezing with a sick, depressed feeling. In field neutralization a bleaching powder solution is used. The same first aid procedures are indicated for victims of diphenylchlorarsine.

These are the most common gases that are used in warfare. There are also other smoke gases and incendiaries such as white phosphorus and thermit. Of these the most important are the incendiaries, particularly the thermit, which is commonly used in the incendiary bombs in modern warfare. Thermit reaches a 5,000 degree heat and ignites almost all materials with which it may come into contact. White phosphorus is dangerous for the burning pieces may adhere to the skin and clothing. Victims of these two products are generally treated for burns.

The importance of proper first aid for gas victims can not be over-emphasized. The following rules which apply in all cases are given by the Office of Civilian Defense:

- A. Act promptly and quietly; be calm.
- B. Put a gas mask on the patient if gas is still present, or, if he has a mask on, check to see that his is properly adjusted. If a mask is not available, wet a handkerchief or other cloth and have him breathe through it.
- C. Keep the patient at absolute rest; loosen clothing to facilitate breathing.
- D. Remove the patient to a gas-free place as soon as possible.
- E. Summon medical aid promptly; if possible, send the victim to a hospital.
- F. Do not permit the patient to smoke, as this causes coughing and, hence, exertion.

Dr. W. J. McConnell, Assistant Medical Director of the Metropolitan Life Insurance Company, has provided an important memorandum on protective measures against common implements of warfare. In it there appears detailed information relative to the effects of poisonous gases, the materials that should be commonly used to counteract them and outlines treatment for victims. He says: "Civilian defense measures against air raid attacks must aim at prevention of panic and of large scale injuries and damage. Complete protection is not possible, but major catastrophe is to some extent preventable by training of the population in orderly and disciplined behavior."

As far as can be determined the efficient chemical warfare materials of England, France, Germany, Italy and the United States are practically the same.

Although gas has not been used in the present war it can and, undoubtedly, will be used at any time that it will give military advantage whether for offense, for defense, or for harassing and destroying civilians' morale.

This outline of poisonous gases and methods of combating them is not given for the purpose of causing any undue alarm but because of the uncertainty of enemy attack that may be made upon the Pacific Coast, it is highly important that all health officers, public health nurses and individuals trained in first aid should know of these gases that have been used and should have full knowledge relative to the methods that are known to be effective in counteracting their disastrous effects.

VENEREAL DISEASE AMONG SELECTEES

An exhaustive epidemiologic study on a group of men given medical examinations by Selective Service Boards is described by Dr. Robert Dyar, San Joaquin Local Health District, in *Venereal Disease Information*.*

Of the 3,054 men examined in San Joaquin County from November, 1940, to July 1, 1941, blood tests were positive for 3.92 per cent. By races and nationalities, per cent of positivity was: white, 3.43; negro, 27.34; Chinese, 12.07; Japanese, 2.25; other, 13.33.

Persons of Mexican extraction were separated, on the basis of names, from the group classified as white by draft boards. On the basis of this segregation which, as the author states, permits possibility of great error, the percentage of positivity for whites was 2.50 and for Mexicans, 5.20. Both negroes and Mexicans were found to have a relatively high infection rate in the age group under 25.

The names of 2,934 seronegative selective service registrants were checked against the health district records. Twenty-two seronegative cases of syphilis were found representing approximately one-sixth of the total known syphilis in the entire group. Among whites 20 per cent of the total known cases were seronegative, among negroes, 10 per cent. The author concludes that "it can perhaps be assumed that rates based on positive serologic tests for other California counties similar to San Joaquin represent a minimum of 80 to 90 per cent of the total syphilis in samples of similar composition."

Of the 22 seronegative cases, five were classed by their local draft board as fit for general military service, 11 as fit for limited service, five as unfit for service, and one was deferred because of dependents.

A comparison of prevalence of known syphilis, seropositive and seronegative, among Selective Service registrants and parturient women in San Joaquin County was made with the following results: white registrants, 3.15 per cent positive; white parturient women, 1.40; Mexican registrants, 5.81; Mexican parturient women, 7.42; negro registrants, 30.46; negro parturient women, 34.78.

Of the 129 registrants reported to the health district as having positive or doubtful serology, the treatment status of 21 was already known. Of the remaining 108 men, 72 reported to the health district in response to a letter; six in response to the first field visit; only eight required two or more visits; 12 (generally agricultural transients) could not be located by letter or visits; 10 were transferred to other agencies.

Subsequent serology and examination failed to establish syphilis in five of the 129 men. Of these, four were reported by Selective Service Boards as having positive serology and one was doubtful.

Forty-six of the 124 men considered syphilitic were newly discovered cases, most of whom were ignorant of their infection. Seventy per cent of the cases among orientals were newly discovered as contrasted to 31 per cent of the negro and 34 per cent of the white persons.

"The fact that over one-third of the infected registrants had never been known to a medical agency is to some extent indicative of the necessity of further intensive case-finding measures locally, for 70 per cent of the newly discovered cases had resided in the county for over two years and only two were transients," the author states.

Sixty-six individuals were known to have had previous treatment but only eight were considered adequately treated and only 21 were under active treatment at the time of investigation.

About one-fourth of the newly discovered and lapsed cases were referred to physicians in private practice, the remainder were admitted to the public health clinic.

Physical examinations of the group with positive serology also revealed two cases of acute gonorrhea and one case of chancroid, previously unknown.

The study conducted by Dr. Dyar was supported by grants to the California State Department of Public Health by the International Health Division of the Rockefeller Foundation and the U. S. Public Health Service.

With stupidity and sound digestion men may fret much; but what in these dull unimaginative days are the terrors of conscience to the diseases of the liver.—Carlyle.

* *Venereal Disease Information*, Vol. 23, No. 2. February, 1942, pages 43-50.

MORBIDITY***Complete Report for Certain Diseases Recorded for Week Ending February 28, 1942****Chickenpox**

1340 cases from the following counties: Alameda 230, Amador 33, Butte 25, Calaveras 1, Contra Costa 11, Del Norte 2, Fresno 35, Imperial 12, Inyo 2, Kern 35, Kings 17, Los Angeles 434, Madera 3, Marin 1, Merced 13, Monterey 3, Nevada 7, Orange 45, Placer 2, Plumas 5, Riverside 27, Sacramento 21, San Bernardino 52, San Diego 133, San Francisco 45, San Joaquin 4, San Luis Obispo 2, San Mateo 3, Santa Barbara 46, Santa Clara 46, Shasta 3, Sonoma 9, Tehama 12, Tulare 3, Ventura 15, Yolo 2, Yuba 1.

German Measles

602 cases from the following counties: Alameda 131, Butte 1, Fresno 4, Humboldt 1, Imperial 4, Kern 20, Los Angeles 73, Marin 3, Merced 32, Modoc 10, Monterey 4, Orange 4, Riverside 5, Sacramento 1, San Benito 1, San Bernardino 2, San Diego 80, San Francisco 102, San Joaquin 12, San Luis Obispo 22, San Mateo 3, Santa Barbara 9, Santa Clara 10, Shasta 1, Siskiyou 4, Solano 8, Sonoma 1, Stanislaus 18, Sutter 1, Tulare 32, Yolo 2, Yuba 1.

Measles

3749 cases from the following counties: Alameda 272, Butte 140, Calaveras 2, Colusa 2, Contra Costa 12, Del Norte 10, El Dorado 4, Fresno 272, Humboldt 10, Imperial 52, Kern 31, Kings 149, Los Angeles 838, Madera 112, Marin 13, Mendocino 7, Merced 40, Modoc 1, Monterey 16, Napa 2, Orange 53, Placer 11, Riverside 52, Sacramento 222, San Bernardino 91, San Diego 408, San Francisco 85, San Joaquin 129, San Luis Obispo 33, San Mateo 2, Santa Barbara 234, Santa Clara 10, Santa Cruz 5, Solano 12, Sonoma 5, Stanislaus 144, Sutter 7, Tulare 73, Ventura 58, Yolo 54, Yuba 76.

Mumps

1914 cases from the following counties: Alameda 261, Butte 15, Calaveras 1, Colusa 2, Contra Costa 45, Del Norte 20, Fresno 32, Humboldt 2, Imperial 85, Kern 70, Kings 39, Los Angeles 392, Madera 17, Marin 5, Merced 10, Monterey 26, Napa 1, Orange 70, Placer 1, Plumas 13, Riverside 27, Sacramento 129, San Bernardino 34, San Diego 240, San Francisco 93, San Joaquin 55, San Luis Obispo 27, San Mateo 6, Santa Barbara 33, Santa Clara 77, Santa Cruz 7, Shasta 4, Solano 3, Sonoma 28, Stanislaus 1, Sutter 2, Tehama 3, Trinity 1, Tulare 9, Ventura 12, Yolo 15, Yuba 1.

Scarlet Fever

133 cases from the following counties: Alameda 1, Calaveras 1, Fresno 1, Imperial 2, Kern 2, Los Angeles 60, Marin 2, Merced 5, Modoc 1, Monterey 3, Orange 7, Riverside 3, Sacramento 6, San Diego 8, San Francisco 6, San Joaquin 5, San Luis Obispo 10, Santa Barbara 1, Santa Clara 2, Santa Cruz 1, Shasta 1, Solano 1, Stanislaus 2, Sutter 1, Yuba 1.

Whooping Cough

280 cases from the following counties: Alameda 33, Contra Costa 2, Fresno 17, Imperial 3, Kern 6, Kings 18, Los Angeles 66, Madera 1, Mendocino 16, Modoc 3, Monterey 1, Orange 11, Plumas 4, Riverside 2, Sacramento 11, San Bernardino 8, San Diego 27, San Francisco 4, San Joaquin 8, San Mateo 2, Santa Barbara 10, Santa Clara 8, Santa Cruz 5, Shasta 2, Solano 1, Sonoma 1, Stanislaus 1, Tulare 1, Ventura 2, Yolo 4, Yuba 2.

Diarrhea of Newborn (Epidemic)

One case from Los Angeles County.

Diphtheria

7 cases from the following counties: Los Angeles 2, Orange 1, San Diego 1, San Luis Obispo 1, Santa Clara 1, Sonoma 1.

Dysentery (Bacillary)

3 cases from the following counties: Kings 1, Los Angeles 2.

Epilepsy

42 cases from the following counties: Alameda 1, Kern 1, Los Angeles 27, Orange 3, Riverside 2, San Bernardino 2, San Francisco 5, Stanislaus 1.

Food Poisoning

8 cases from the following counties: San Francisco 5, Yolo 3.

Influenza

134 cases reported in the State.

Malaria

3 cases from the following counties: Imperial 1, San Luis Obispo 2.

* Data regarding the other reportable diseases not listed herein, may be obtained upon request.

Meningitis (Epidemic)

3 cases from the following counties: Napa 1, San Francisco 1, Solano 1.

Poliomyelitis

2 cases from the following counties: Alameda 1, Los Angeles 1.

Rabies (Animal)

15 cases from the following counties: Fresno 1, Imperial 1, Los Angeles 10, San Diego 3.

Rheumatic Fever

6 cases from the following counties: Kern 2, Los Angeles 3, Orange 1.

Septic Sore Throat

42 cases from Santa Clara County.

Typhoid Fever

One case from Kern County.

Undulant Fever

2 cases from the following counties: Alameda 1, Merced 1.

RETORT OPERATORS MUST BE CITIZENS

The California State Board of Public Health at its regular meeting held in San Francisco February 21st amended regulations for the operation of steam-controlled retorts in canneries licensed by the department so as to provide for the employment, as operators, of American citizens only. The amendment to the regulations, Number 3-A, reads as follows:

No person other than an American citizen is permitted to operate steam-controlled retorts used in the sterilization of canned food products in the canneries licensed by the California State Department of Public Health.

Every person to whom is issued a permit to operate steam controlled retorts for the sterilization of canned food products in the State of California, shall furnish a notarized record and history which shall bear the information as stated on the PERSONNEL RECORD-RETORT OPERATOR form issued by the State Department of Public Health.

The rural dweller in the United States has, on the average, four or five years longer life than the urban resident. Among white males dwelling in rural areas the average length of life is 62.09 years, while for urban residents, it is 56.73 years. The corresponding figures for white females are 65.09 years and 61.05 years. These figures are based on the calendar year 1930.—Louis L. Dublin, Ph.D.

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